Well-known and little-known: miscellaneous notes on Peruvian Orthalicidae (Gastropoda, Stylommatophora)

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The family Orthalicidae is well represented in Peru but, like in other families, some species are well-known and others have not been reported on since their original descriptions. In this paper we present new records for well-known species and elucidate the status of several lesser known taxa. Four taxa are described as new: *Bostryx chusgonensis sipas, B. fragilis*, *Scutalus (Scutalus) mariopenai* and *S. (S.) phaeocheilus altoensis*. The following species are recorded as new to the Peruvian malacofauna: *Corona pfeifferi, Drymaeus (D.) branneri,* and *Thaumastus flori*. *Strophocheilus tenuis* Haas, 1955 is now considered synonymous with *Thaumastus (Paeniscutalus) crenellus* (Philippi, 1867). *Plekocheilus conspicuus* Pilsbry, 1932 is now placed in the synonymy of *Thaumastus flori* (Jousseaume, 1897). *Drymaeus tigrinus* Da Costa, 1898 is now considered a junior subjective synonym of *Drymaeus (D.) strigatus* (Sowerby, 1838).

Introduction

The malacofauna of Peru is rich and very diverse. Ramírez et al. (2003) list 763 species (excl. subspecies) of land snails, belonging to 28 families. The family Orthalicidae (*sensu lato*) encompasses 442 species in this list, i.e. 58% of the terrestrial malacofauna. When this figure is compared with those for some other countries in the region, Peru stands out in its diversity, not only of the Orthalicidae but of land snails in general (fig. 1). Like in other faunas, some species are well-known and have been repeatedly reported on; their distributions sometimes extend for several hundreds of kilometres. Other species have hardly been mentioned after their original description and may be very range-restricted. In this paper we present new records for well-known species, elucidate the status of several lesser known taxa and describe four new taxa.

The following abbreviations are used to refer to museum collections: BMNH – Natural History Museum, London, UK; FG – private collection of Federico Gutierrez, Lima, Peru; FML – Fundación Miguel Lillo, Tucumán, Argentina; FMNH – Field Museum of Natural History, Chicago, USA; MNCN – Museo Nacional de Ciencas Naturales, Madrid, Spain; MNHN – Muséum National d'Histoire Naturelle, Paris, France; RMNH – Netherlands Centre for Biodiversity Naturalis, Leiden, the Netherlands; SMF – Natur-Museum Senckenberg, Frankfurt am Main, Germany; VMA – private collection of V. Mogollón Avila, Lima, Peru.

Other abbreviations: AG, albumen gland; D, shell diameter; DP, distal part of penis; PP, proximal part of penis; EP, epiphallus; FL, flagellum; H, shell height; HA, height of

aperture; LW, height of last whorl; M, mean; max, maximum; min, minimum; OV, oviduct; P, penis; RM, retractor muscle; RS, receptaculum seminis; s, standard deviation; SD, spermathecal duct; SOV, spermoviduct; SP, spermatheca; VD, vas deferens; WA, width of aperture. Measurements were taken following Breure (1974: figs 2-3).

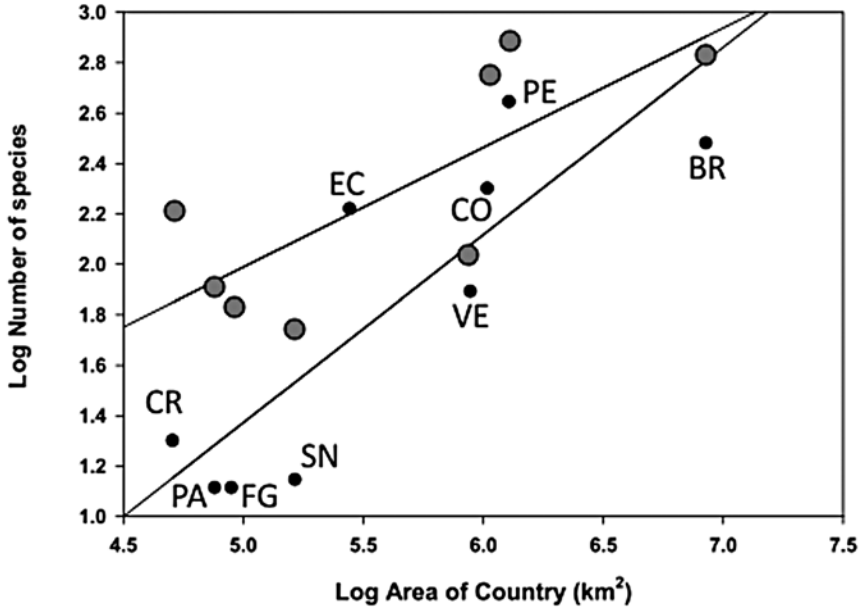


Fig. 1. Species-area relationships of total numbers of land snails (gray dots) resp. Orthalicidae (black dots) in selected countries. Number of taxa based on Breure & Borrero, 2008 (Orthalicidae, EC – Ecuador); Borrero & Breure, unpublished data (both, CO – Colombia); Breure, unpublished data (Orthalicidae, VE – Venezuela; both, SN – Suriname); Gargominy, 2009 (both, FG – French Guiana); Martínez, 2003 (land snails, Venezuela); Ramírez et al., 2003 (both, PE – Peru); Simone, 2006 (both, BR – Brazil); Thompson, 2008 (both, CR – Costa Rica, PA – Panama). Regression lines: total land snails $R^2 = 0.590$, non-significant ($p>0.05$); Orthalicidae $R^2 = 0.725$, significant ($p<0.05$).

Systematic part

Family Orthalicidae Albers, 1860
Genus *Thaumastus* Albers, 1860

Thaumastus Albers, 1860: 215.

Subgenus *Paeniscutalus* Wurtz, 1947

Paeniscutalus Wurtz, 1947: 12.

Thaumastus (Paeniscutalus) crenellus (Philippi, 1867)

Strophocheilus (Microborus) tenuis Haas, 1955: 330, fig. 70 (holotype FMNH 51925). Syn. nov.

Material examined.— Peru, Dept. Lima, Rio Cañete valley, Magdalena [2300 m, 12°29'27'S 075°54'42'W], leg. V. Mogollón Avila, 8.xii.2008 (RMNH 114275/11, VMA 0096/13).

Remarks.— *Strophocheilus (Microborus) tenuis* Haas, 1955 is here considered a junior subjective synonym of *Thaumastus crenellus* (Philippi, 1867). The protoconch sculpture consists of waving, partly broken axial wrinkles, more compact on the last part of the protoconch. This is totally unlike any Strophocheilidae, the family in which this taxon is currently classified. The type locality of *S. tenuis*, Dept. Ancash, Yungay [2500 m, 09°08'40'S 077°44'37'W], is well in range with the known occurrences of *T. crenellus* (Breure, 1978: 34). The new record extends the distribution ca. 90 km further southward.

Subgenus *Thaumastus* Albers, 1860
Thaumastus (T.) flori (Jousseaume, 1897)
(figs 15-20)

Dryptus flori Jousseaume, 1897: 265 (lectotype MNHN 22474).
Plekocheilus conspicuus Pilsbry, 1932: 390, pl. 27 figs 4-5 (holotype ANSP 141959).

Material examined.— Peru, Dept. Piura, Prov. Ayabaca, Inia, leg. local people, x.2005 (FG/1, VMA 0178/3); Ibidem, x.2006 (VMA 0179/10); Ibidem, x.2007 (VMA 0180/5).

Remarks.— This is the first Peruvian record of this southern Ecuadorian species, described from Machala. While figures 15-16 shows typical *Thaumastus flori*, there is in the material notably variation in the shape of the aperture (figs 17-20), resembling *T. hartwegi* (Pfeiffer, 1846). Comparison with the holotype (BMNH 1975126) shows that the latter species has a less swollen last whorl. Further investigation may prove these taxa to be conspecific.

Pilsbry (1932) described *Plekocheilus conspicuus* from Peru, Dept. Tumbes, near Bellavista and Huasimal. He tentatively referred the new taxon to *Plekocheilus*, based on the structure of the columella and colour pattern. The figured type resembles closely some specimens from Ayabaca, which is adjacent to the type locality of *P. conspicuus*. We consider now this taxon to be a junior subjective synonym of *Thaumastus flori*.

Genus *Bostryx* Troschel, 1847

Bostryx Troschel, 1847: 49.

Bostryx anomphalus Pilsbry, 1944

Bostryx (Peronaeus) anomphalus Pilsbry, 1944: 123, pl. 11 fig. 7 (holotype ANSP 180002a).

Material examined.— Peru, Dept. Ancash, Catzcal [09°54'43'S 077°49'40'W, 1041 m], V. Mogollón Avila leg., 25.x.2007 (RMNH 114043/19, VMA 0005/7); Dept. Piura, El Alto [04°14'37'S 081°12'21'W, 250 m, leg. V. Mogollón Avila, 24.xii.2005 (RMNH 114065/3, VMA 0030/4).

Remarks.— This is a variable species in its colour pattern, some specimens being uniformly whitish, others with axial streaks of various shades of brown at irregular

intervals. Several specimens show a faint pattern of two or three spiral bands on the last whorl, the broadest around the shell base and one or two above the periphery. The upper whorls are whitish, bluish or in some specimens roseate. Hitherto, the northernmost limit of this species is Dept. Cajamarca (Breure & Neubert, 2008).

Bostryx ceroplasta (Pilsbry, 1896)

Bulimulus (Bostryx) ceroplasta Pilsbry, 1896: 159, pl. 50 figs 38-39 (lectotype ANSP 25468).

Material examined.— Peru, Dept. La Libertad, Chagual [07°50'S 077°38'W, 1275 m], leg. V. Mogollón Avila, 20.viii.1994 (RMNH 114052/5, VMA 0049/11); Dept. Amazonas, Balsas, leg. V. Mogollón Avila, 6.iv.2005 (RMNH 114066/5, VMA 0013/14).

Remarks.— The shells are, as Pilsbry calls them, 'waxen white'. Some specimens have the apex coloured, corneous or with a yellow hue.

Bostryx chusgonensis sipas subspec. nov.
(figs 21-22)

Type material examined.— Peru, Dept. Amazonas, Shipasbamba [05°54'25'S 078°02'35'W, 1360 m], leg. L. Angulo, xii.2001. Holotype RMNH 114059, paratypes RMNH 114060/3 + 4 juv., VMA 0033/9.

Diagnosis.— Characterized by its small size (13 mm), spindle-shape, whitish colour and smooth surface.

Description.— Shell up to 13.4 mm, three times as long as wide, rimate, spindle-shaped, with slightly convex sides, rather thin. Colour uniformly greyish-whitish or with axial streaks of light to dark-brown, the upper whorls somewhat darker; a dark band around the rimate umbilicus. Surface hardly shining, with incrassate growth striae. Protoconch smooth. Whorls 6.5, hardly convex; suture slightly impressed. Aperture elongate-ovate, margins somewhat converging; 1.59 times as long as wide, 0.25 times the total height. Peristome simple, whitish. Columellar margin straight, hardly expanded; no parietal callus.

Dimension of holotype: H 13.5 D 4.7 HA 5.2 WA 3.2 LW 8.39; 6.5 whorls.

Remarks.— This new subspecies differs from *Bostryx c. chusgonensis* Weyrauch, 1960 by (1) being larger (up to 13.4 vs. 11.4 mm), (2) the less impressed suture, (3) in streaked specimens, the axial streaks continuing till the base of the shell. According to Weyrauch (1960a: 30) a ribbed form and a colour form with small brownish dots occur in the nominate subspecies. These forms have not been observed in our specimens. The nominate taxon was described from Dept. La Libertad, Río Chusgon area, at 1550-1900 m. The new material extends the range ca. 180 km more northward within the drainage system of the Río Marañon; the new taxon is separated by mountain ranges from the nominate subspecies.

Etymology.— (Quechua) sipas, young woman; referring to the spindle-shaped shell and to the type locality, Shipasbamba. The epithet is used as a noun in apposition.

Bostryx edmundi Breure & Neubert, 2008

Bostryx edmundi Breure & Neubert, 2008: 324, figs 11-16 (holotype SMF 162195a — *recte* 331475).

Material examined.— Peru, Dept. Lima, Magdalena [2300 m, 12°29'27'S 075°54'42'W], leg. V. Mogollón Avila, 8.xii.2005 (RMNH 114050/10).

Remarks.— The number of the holotype should be corrected to SMF 331475 (R. Janssen, pers. comm.). Additional material of this species has been found about 5 km north of the type locality, Yacca. There are no differences between the specimens from this locality and the type locality.

Bostryx elatus (Philippi, 1869)

Bulimus elatus Philippi, 1869: 33.

Material examined.— Peru, Dept. Huancavelica, Mejorada [ca. 3000 m, 12°30'S 074°49'W], leg. J.J. Bravo (RMNH 114053/16, VMA 0048/2).

Remarks.— This species was originally described from 'Pichicna, 2 leagues from Icucha […] between Mayoc and Huanta'. This points to a region between Mayoc in Dept. Huancavelica, 2200 m, 12°48'40'S 074°23'07'W and, most probably Huanta [misspelling for Huantana], 3000 m, 13°46'01'S 073°37'13'W in Dept. Apurimac. Haas (1955) reported on specimens collected near Mayoc and Locroja [3700 m, 12°41'S 074°26'W] in Dept. Huancavelica and added Palmira [2300 m, 13°35'19'S 073°11'25'W] in Dept. Apurimac. The new locality is ca. 55 km NW Mayoc. Dimensions of the material, see table 1.

Table 1. Dimensions in *Bostryx elatus* (n = 10).

	H	D	HA	WA	LW	W
M	18,4	6,3	4,9	3,26	7,8	8,5
s	0,84	0,23	0,29	0,16	0,37	0,51
max	19,7	6,7	5,2	3,4	8,3	9,8
min	16,9	6	4,3	3	7,3	8,1

Haas (1955) also noted that the colour pattern varied more in the specimens from near Mayoc and Locroja. The variety in patterns, from uniformly greyish-white to uniformly streaked at irregular intervals, is also observed in our material. The aberrant pattern noted by Haas, viz. streaks with 'lateral, triangular appendages that tend to be arranged in spiral rows' has been observed in a single shell from the series examined.

Bostryx fragilis spec. nov.
(figs 23-25)

Type material examined.— Peru, Dept. Tumbes, Quebrada Santa Maria [03°40'53'S 080°26'10'W, 25 m], leg. V. Mogollón Avila, 25.i.2004 Holotype RMNH 114063, paratypes RMNH 114064/7, VMA 0020/22); Ibidem, Quebrada Charán [03°39'00'S 080°36'02'W], Caleta La Cruz, 10 m, leg. V. Mogollón Avila & K. Valdivia Pérez, 23.i.2004 (paratypes VMA 0021/8, 0023/3).

Diagnosis.— A *Bostryx* species characterized by the whitish lines on the thin, translucent shell, the tawny-brownish upper whorls and the prominent last whorl.

Description.— Shell up to 18.9 mm, two times as long as wide, narrowly perforate, elongate, with hardly convex sides, fragile. Colour whitish on a translucent background, the upper whorls becoming gradually tawny-brown towards the apex. Surface slightly shining, the incrassate growth striae overlaid on the last whorls by whitish, low, axial costulae, which are partly forked and do not always cover the whole whorl, but may end in between the sutures or shell base. Upper whorls with fine, interrupted spiral threads. Protoconch with wrinkles, mostly broken into granules and crossed by finely incised spiral lines. Whorls 6.8, hardly convex, suture slightly impressed. Aperture elongate-subovate, 1.61 times as long as wide, 0.40 times the total height. Peristome thin, simple. Columellar margin nearly straight, very narrowly dilated above.

Dimension of holotype: H 18.0 D 8.7 HA 7.3 WA 4.5 LW 11.3; 6.8 whorls. See also table 2.

Table 2. Dimensions in *Bostryx fragilis* spec. nov. (n = 7).

	H	D	HA	WA	LW	W
M	17,7	8,8	7,1	4,4	10,7	6,8
s	0,64	0,41	0,55	0,35	0,85	0,16
max	18,9	9,2	8,2	5	11,9	7,1
min	16,9	8	6,6	4	9,2	6,6

Remarks.— Closely allied to *Bostryx juana* (Cousin, 1887) from which it differs by (1) being smaller, (2) slightly more slender and (3) lacking the tawny-brown spiral bands. This novelty further resembles *B. alausiensis* (Cousin, 1887), also described from southern Ecuador (see Breure, 2008). It differs by being (1) smaller, (2) stouter, and (3) having a larger aperture. Finally, it may be compared to *B. delicatulus* (Philippi, 1867) from which it differs by (1) being stouter, (2) the brownish upper whorls and (3) the simple peristome.

There is a morphological resemblance between the species mentioned above and some *Bulimulus* species occurring in the same region, e.g. *B. inconspicuus* Haas, 1949, both in general shell shape and - superficially - also in protoconch sculpture. The relationships and phylogeography of these two genera in this region warrant further study.

Etymology.— The epithet refers to the thin shell; (Latin) *fragilis*, fragile. The epithet is to be used as an adjective.

Bostryx granulatus Breure & Neubert, 2008

Bostryx granulatus Breure & Neubert, 2008: 325, figs 17-19 (holotype SMF 162178).

Material examined.— Peru, Dept. Lima, Yauyos [3100 m, 12°27'44'S 075°55'20'W], leg. V. Mogollón Avila, 8.xii.2005 (topotypes RMNH 114040/5, 114041/5, VMA 0026/7).

Remarks.— The topotypes collected show that the granulation, which is visible in fresh collected specimens, fades away when the shells are bleached; otherwise these specimens are characteristic. It may be noted that smaller specimens may also be compared to *Bostryx superbus* Weyrauch, 1967, a species living at higher altitudes in the same Río Cañete valley. *B. granulatus*, however, may be distinguished by the slightly expanded base of the lip, the more slender shell shape and the granulation on the last whorl.

Bostryx longispira Weyrauch, 1960

Bostryx (Pseudoperonaeus) longispira Weyrauch, 1960b: 128, pl. 11 figs 4-5 (holotype SMF 162112).

Material examined.— Peru, Dept. Lima, Magdalena, leg. V. Mogollón Avila, 8.xii.2005 (RMNH 114051/15, VMA 0009/230).

Remarks.— This species appears to be locally abundant.

Bostryx turritus (Broderip, 1832)
(fig. 9)

Bulinus turritus Broderip in Broderip & Sowerby, 1832: 106.

Material examined.— Peru, Dept. Ancash, Catzcal [1050 m, 09°54'43'S 077°49'40'W], leg. V. Mogollón Avila, 25.x.2007 (RMNH 114058/13; VMA 0004/8); Ibidem, 970-1300 m, V. Mogollón Avila, 25.i.2009 (VMA 0137/17).

Animal.— Living animal whitish-grey throughout, the black eye-retractors shining through the tentacles and the dorsal side of the body (fig. 9).

Remarks.— This species was known from Dept. La Libertad, Trujillo (Pilsbry, 1896) and Ancash, Pariacoto (Haas, 1955). Recently, Ramírez (2004) reported it from Dept. Lima, Cerro Pasamayo and Salinas de Huacho. She also refers to unpublished data by Weyrauch, who collected the species at Cerro Campana, 14 km N Trujillo [07°58'54'S 079°06'24'W] (selected as type locality by Ramírez) and in Dept. Cajamarca, near Chilete. Breure (1978) reported the species from the same department near Magdalena.

Zilch (1953) reports *B. t. turritus* (H/D = 3.25) from Dept. La Libertad, Hacienda El Casa Grande (probably near 07°40'S 078°40'W), and described *B. t. tamboensis* (H/D = 2.87) from the same locality, albeit from different elevations (1500 m resp. 1000 m). According to Haas (1955) – reporting a locality at 1360 m – his shells 'are slightly more slender than the typical form'. The specimens from Catzcal show a variation in H/D from 2.84 to 3.18 (mean 3.00; n = 7; see also table 3). It is possible that this variation can also be found in the populations at the localities in La Libertad, in which case *B. t. tamboensis* should be considered a synonym of the nominate taxon.

Table 3. Dimensions in *Bostryx turritus* (n = 7).

	H	D	HA	WA	LW	W
M	21,3	7,1	5,3	3,3	8,5	9
s	0,7	0,18	0,22	0,09	0,46	0,66
max	22,3	7,4	5,5	3,4	9,2	10,1
min	20,5	6,9	4,9	3,2	7,8	8,1

Genus *Bulimulus* Leach, 1814

Bulimulus Leach, 1814: 42.

Bulimulus inconspicuus Haas, 1949

Bulimulus (Bulimulus) inconspicuus Haas, 1949: 236, fig. 50a (holotype FMNH 30038).

Material examined.— Peru, Dept. Loreto, Iquitos, leg. G. Montalván Naranjos, iii.2004 (RMNH 114042/2, VMA 0043/9); Ibidem, near Laguna Quistococha, leg. G. Montalván Naranjos, 15.vii.2009 (VMA 0186/6); Ibidem, 23.xii.2009 (VMA 0190/1).

Remarks.— Haas (1949) compared this species to *Bulimulus transparens* (Reeve, 1849), stating that his material was slightly smaller (17 vs. 19 mm shell height). The type material of *B. transparens* is in the London museum (BMNH 1975397) and is labelled 'Venezuela' (Breure, 1978: 147). If this locality is correct, a close relationship as suggested by Haas seems improbable. Adult specimens of *B. inconspicuus* can measure up to 25 mm shell height (RMNH; VMA 0043). The species is characterized by the corneous-brown upper whorls and the suture, which is bordered by a white line, descending slightly in front.

Genus *Naesiotus* Albers, 1850

Naesiotus Albers, 1850: 162.

Naesiotus bambamarcaensis Weyrauch, 1960

Naesiotus (Naesiotus) bambamarcaensis Weyrauch, 1960a: 37, pl. 6 fig. 38 (holotype SMF 156220).

Material examined.— Peru, Dept. Cajamarca, Chalamarca [06°29'29'S 078°28'07'W], P. Bustamante leg., 30.xii.2004 (RMNH 114049/5, VMA 0047/2).

Remarks.— This species was hitherto only known from the type locality, Cerro Machaipungo near Bambamarca, about 20 km SSW of the new locality Chalamarca. The specimens are slightly smaller than the holotype and vary in their dimensions, but otherwise show the colour pattern characteristic for this species, viz. corneous-brown with a whitish spiral band at the periphery of the last whorl. See also table 4.

Table 4. Dimensions in *Naesiotus bambamarcaensis* (n = 5).

	H	D	HA	WA	LW	W
M	14	6,6	5,7	3,4	8,5	6,1
s	0,99	0,27	0,29	0,19	0,36	0,4
max	15,2	6,9	5,9	3,6	8,8	6,5
min	12,5	6,2	5,2	3,1	8	5,6

Naesiotus pilsbryi Weyrauch, 1956

Naesiotus pilsbryi Weyrauch, 1956: 6, pl. 1 fig. 4 (holotype SMF 155698).

Material examined.— Peru, Dept. La Libertad, Chagual [07°50'S 077°38'W, 1275 m], leg. V. Mogollón Avila, 20.viii.1994 (topotypes RMNH 114046/9, VMA 0044/8).

Remarks.— This species is known from the type locality only and may be range-restricted.

Genus *Scutalus* Albers, 1850
Subgenus *Scutalus* Albers, 1850

Scutalus Albers, 1850: 160.

Scutalus (Scutalus) phaeocheilus altoensis subspec. nov.
(figs 5, 26)

Type material examined.— Peru, Dept. Piura, El Alto [04º14'37' S 081º12'21' W, 250 m], leg. V. Mogollón, xii.2005, 200-290 m. Holotype RMNH 114045; paratypes RMNH 114044/14, 114069/7; VMA 0027/22, 0034/12.

Diagnosis.— A taxon of *Scutalus (S.)* characterized by the whitish colour, the sculpture of growth striae and inconspicuous granules on the last whorl, the broadly expanded lip and the orange colour of the aperture inside.

Description.— Shell up to 38.1 mm, 1.71 times as long as wide, deeply perforated, conical, with slightly convex sides; solid. Colour uniformly (greyish-)whitish, the upper whorls somewhat lighter in greyish-white specimens. Surface lustreless, with incrassate growth striae and inconspicuous granulation, under a strong lens visible as spiral rows of shallowly raised, short oblong granules; only in fresh specimens this granulation may be observed on the third and following whorls. Protoconch pit-reticulate. Whorls 5.8, somewhat convex; suture impressed, crenulated, at the aperture ascending in front. Aperture large, ovate, in fresh shells orange inside; margins converging; 1.33 times as long as wide, 0.73 times the total height. Peristome broadly expanded and reflexed, whitish. Columellar margin straight, broadly expanded and merging into the parietal callus, which is whitish and thickened in some specimens.

Dimension of holotype: H 37.2 D 21.4 HA 19.5 WA 14.6 LW 25.9; 5.8 whorls. See also table 5.

Table 5. Dimensions in *Scutalus (S.) phaeochilus altoensis* subspec. nov. (n = 9).

	H	D	HA	WA	LW	W
M	36,3	21,2	20,5	15,4	26,5	5,8
s	1,35	0,97	1,12	1,02	1,05	0,1
max	38,1	22,7	22,8	17	28	6
min	34,3	19,9	19,3	14,2	25,1	5,7

Remarks.— This subspecies differs from *Scutalus (S.) p. phaeocheilus* (Haas, 1955), occurring further south in Dept. Lambayeque, by (1) being slightly smaller, (2) having the lip more broadly expanded and (3) having the aperture differently coloured (the nominate taxon has the aperture liver-coloured).

When describing the nominate taxon, Haas already noted the relationship with *Scutalus (S.) proteiformis* (Dohrn, 1863). He stated that this species 'seems to lack the granules entirely' (Haas, 1955: 335). According to Pilsbry (1897: 15), who copied the original description, the 'granulation [is] confined to the last whorl'. However, *S. phaeocheilus altoensis* is smaller and slightly stouter than *S. proteiformis* and is also slightly more granulose than this species, especially visible in fresh specimens. Moreover, *S. proteiformis* is said to have the aperture dark brown coloured. Dohrn's species, which has not been figured, was mentioned by Weyrauch (1967) from northern Peru without further information.

Etymology.— The epithet *altoensis* refers to El Alto, the type locality (fig. 5) and home town of the second author, and is a noun in the genitive case.

Scutalus (Scutalus) mariopenai spec. nov.
(figs 16-23)

Type material examined.— Peru, Dept. Ancash, Catzcal [09°54'43'S 077°49'40'W], leg. V. Mogollón, 25.x.2007, 1041 m. Holotype RMNH 114055; paratypes RMNH 114056/5+2 juv., 114057/11; VMA 0016/18); Ibidem, leg. J.A. Kostelac, 2.xi.2001 (VMA 0015/16). See fig. 7.

Diagnosis.— A species of *Scutalus (S.)* characterized by the broadly expanded and callous lip, the fine, punctuate granulation, and the whitish-corneous ground colour, with four brown spiral bands on the last whorl.

Description.— Shell up to 41.1 mm, 1.65 times as long as wide, umbilicate and deeply perforated, conical, with slightly convex sides; solid. Ground colour uniformly whitish-corneous, the upper whorls lighter, with four spiral light chestnut-brown bands, a small one below the white-lined suture, two broader ones above and below the periphery (which in some specimens are faintly subdivided into two equally broad bands) and a fourth band encircling the umbilicus. Surface lustreless, with growth striae and spiral lines of fine, punctuate granulation, starting shallowly on the postnepionic whorl, but becoming rapidly more conspicuous on the following and fading away inside the umbilicus. Protoconch pit-reticulate. Whorls 6.3, somewhat convex, the last whorl saccate; suture impressed, somewhat crenulate, at the aperture ascending in front. Aperture large, ovate, glossy white inside with the pattern visible in banded specimens; margins converging; 1.30 times as long as wide, 0.70 times the total height. Peristome broadly expanded and backwardly reflexed, glossy whitish. Columellar margin straight, broadly expanded and merging into the rather thick parietal callus.

Dimension of holotype: H 41.1 D 26.2 HA 22.6 WA 17.9 LW 29.6; 6.3 whorls. See also table 6.

Table 6. Dimensions in *Scutalus (S.) mariopenai* spec. nov. (n = 6).

	H	D	HA	WA	LW	W
M	38,9	23,6	21,2	16,3	27,4	6,2
s	1,42	1,51	0,95	0,95	1,24	0,19
max	41,1	26,2	22,6	17,9	29,6	6,5
min	36,7	21,9	20,1	15,3	26	6

Animal.— Living animal whitish- to pale-grey, with a dark-greyish band along the foot. Tentacles dark-grey near the eye-tips, lighter at the base (figs 10, 13).

Remarks.— This species is closely allied to *Scutalus (S.) ortizpuentei* Weyrauch, 1967 which was described from Dept. Cajamarca, Río Chancay valley, between Chiclayo and Chota, 80 km N Quinden [ca. 06°38'S 079°05'W]. It differs from this species by (1) being smaller (41 vs. 48 mm shell height), (2) having a smaller aperture, (3) and the lip more broadly expanded. The faintly visible subdivision of the spiral bands around the periphery, visible in some specimens, resembles the more pronounced colour pattern in *S. ortizpuentei.* It may also be compared to *S. (S.) cretaceus* (Pfeiffer, 1855) from which it differs (1) by being less elongate, (2) having a stronger sculpture on the last whorl, (3) having the inside of the aperture whitish coloured; (4) having the lip more broadly expanded.

Etymology.— Named in honour of Prof. Mario Peña González (Lima), malacologist and tutor of the second author. The epithet is a noun in the genitive case.

Subgenus *Vermiculatus* Breure, 1978

Vermiculatus Breure, 1978: 166.

Scutalus (Vermiculatus) macedoi Weyrauch, 1967

Scutalus (Vermiculatus) macedoi Weyrauch, 1967: 398, figs 42-44 (holotype SMF 162070).

Material examined.— Peru, Dept. Lima, Canta Prov., near Laguna El Viuda [?11°21'45'S 076°38'23'W], leg. D. Oré, 26.x.2008, 4450 m (RMNH 114061/4, VMA 0002/7).

Remarks.— This species, which was described from Dept. Junín, Capillacocha [11°10'09'S 076°02'25'W], 4150 m, is now recorded for the first time from the western slopes of the Cordillera Occidental. The material has the upper whorls reddish-blue and the specimens are more slender than those shown in the original figure of Weyrauch. However, compared to paratypes (RMNH 55449/5), the shell shape is similar.

Genus *Neopetraeus* Martens, 1885

Neopetraeus Martens, 1885: 194.

Neopetraeus filiolus (Pilsbry, 1897)

Drymaeus (Neopetraeus) filiola Pilsbry, 1897: 22 (holotype ANSP 25724).

Material examined.— Peru, Dept. Lima, 0.5 km from Churin to Oyón, 10°47'S 076°52'W [2500 m], leg. J. Hemmen, 9.iii.2004 (RMNH 98108/1).

Remarks.— This species was hitherto only known from Dept. Ancash (Breure, 1978).

Genus *Drymaeus* Albers, 1850
Subgenus *Drymaeus* Albers, 1850

Drymaeus Albers, 1850: 155.

Drymaeus (Drymaeus) branneri F. Baker, 1914
(figs 35-36)

Drymaeus branneri F. Baker, 1914: 637, pl. 23 figs 1-4 (holotype ANSP 109308).

Material examined.— Peru, Dept. Madre de Dios, Prov. Puerto Maldonado, Quebrada Madama [12°31'S 069°03'W], 175 m, leg. S. Macahuachi Encinas, 22.vii.2009 (VMA 0176/1).

Remarks.— Originally described from Brazil, Rondônia State, above Pôrto Velho along the Madeira-Mamoré railroad [= ca. 260 km SW Pôrto Velho], this species is now recorded for the first time from Peru. The specimen corresponds to the original description given by Baker (1914).

Drymaeus (Drymaeus) cecileae (Moricand, 1858)
(figs 11, 31-32)

Bulimus cecileae Moricand, 1858: 452, pl. 14 fig. 4.

Material examined.— Peru, Dept. Loreto, near Río Curaray [01°36'S 075°13'W], 150 m, leg. G. Montalván Naranjos, 6.xi.2008, (RMNH 114184/1, VMA 0077/1) at border of a 'Tahuampa' (inundated zone).

Animal.— The living animal is brownish-beige throughout, including the tentacles (fig. 11).

Remarks.— This specimen corresponds to the description given by Pilsbry (1898: 230, pl. 42 fig. 52). He regarded this taxon as a colour form of *Drymaeus (D.) strigatus* (Sowerby, 1838), which, however, has always a lilac band on the inside, bordering the peristome. While *Drymaeus* species are known for their intraspecific variation in colour pattern, we here consider *D. cecileae* as a distinct taxon characterized by the more or less orange line behind the peristome, visible both on the inside and outside of the shell, and by being more slender than *D. strigatus*.

Drymaeus (Drymaeus) eurystomus (Philippi, 1867)

Bulimus eurystomus Philippi, 1867: 68.

Material examined.— Peru, Dept. Junín, Chanchamayo Prov., 1000 m, leg. J.J. Bravo (RMNH 114070/2, VMA 0095/3).

Remarks.— Fulton (1905) was the first to realize that *Bulimus eurystomus* Philippi, 1867 and *B. hamadryas* Philippi, 1867 are synonyms and only differ in colour pattern. The material from the Bravo collection (Mogollón & Breure, 2009) resembles the figures of Pilsbry (1898: pl. 41 figs 32-33) but differs in lacking the dark spiral band around the umbilicus.

Drymaeus (Drymaeus) strigatus (Sowerby, 1838)
(figs 8, 12, 33-34)

Bulinus strigatus Sowerby, 1838: pl. 143 fig. 95.
Drymaeus tigrinus Da Costa, 1898: 82, pl. 6 fig. 6 (lectotype BMNH 1907.11.21.55). Syn. nov.

Material examined.— Peru, Dept. Loreto, near Río Arabela [01°36'S 075°14'W], 170 m, leg. G. Montalván Naranjos, 6.xi.2007 (RMNH 114062/1, VMA 0181/1). See fig. 8.

Animal.— The living animal is brownish-beige, slightly darker just above the foot; the tentacles are whitish at the base and turning light-beige towards the eyes (fig. 12).

Remarks.— These specimens fit the description presented by Pilsbry (1898: 228), especially the relatively very convex last whorl. However, they differ in lacking a purple streak at the inside of the aperture. In that respect they correspond to the lectotype of *Drymaeus tigrinus* Da Costa, 1898, described from 'Ecuador', which has the inside of the aperture whitish. Although Pilsbry considers *D. strigatus* to be 'excessively variable in coloration', he also noted that *D. tigrinus* seems allied (Pilsbry, 1898). We here con-

sider both taxa to be synonyms.

Various authors have been quoted for this taxon with varying years of publication. Breure (1979) erroneously quoted 1833 as the year of Sowerby's publication. Richardson (1995) attributed the taxon to Pfeiffer, 1841, whereas Sowerby's name is available as indication (Art. 12.2.7 ICZN). We here follow Petit (2009), who has concluded that the part of Conchological Illustrations in which *strigatus* was published, appeared in 1838.

Genus *Corona* Albers, 1850

Corona Albers, 1850: 193.

Corona pfeifferi (Hidalgo, 1869)
(figs 2-4, 14, 37-38)

Orthalicus pfeifferi Hidalgo, 1869: 412 (syntype MNCN 15.05/3280/1)

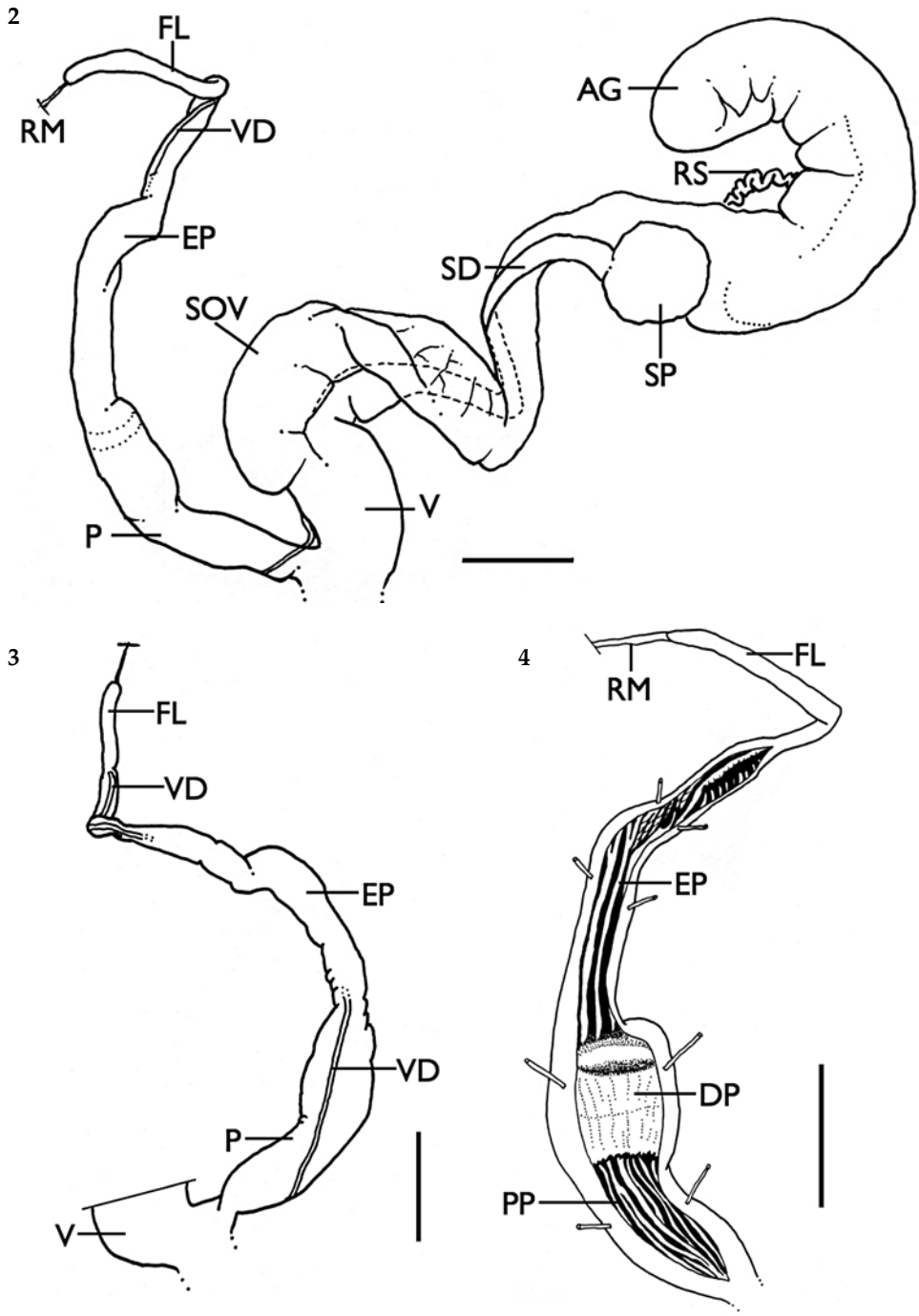
Material examined.— Peru, Dept. Loreto, near Río Curaray [01°36'S 075°13'W], 153 m, leg. C. Rivera, 6.xi.2008, on a tree trunk (RMNH 114067/1, VMA 0076/1).

Animal.— Living animal with coarse, orange tubercles on a whitish skin. Tentacles greyish, with a blue hue near the tips (fig. 14).

Genitalia.— Penis proximally slender and subcylindrical, constricted at the base; median part swollen, pear-shaped, tapering towards the distal part which is subcylindrical again. Transition to the epiphallus with a kink, thereafter gradually tapering; twisted. Vas deferens adhering to and partially inside the penial complex. Flagellum ca. 1/5 the total length of the penial complex.

Internal structure of penial complex with longitudinal folds in proximal part of penis, changing into a dense tubular network and a widened lumen in the distal part of the penis. Epiphalus with 3-4 longitudinal folds proximally, transversing into anatosmosing folds more distally. In the specimen dissected, a chitinous spermatophore was being formed with the shape of flagellum and epiphallus, its initial stage inside the flagellum and extending to the distal part of the penis.

Remarks.— This is the first record of this species from Peru, which was hitherto only known from Ecuador, where it was described from Prov. Pastaza, Canelos.



Figs 2-4. Genitalia of *Corona pfeifferi* (Hidalgo). 2, ventral overview; 3, dorsal view of penial complex; 4, half-schematic longitudinal section of penial complex. Scale line = 0.5 mm.

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Fig. 5. Type locality of *Scutalus phaeocheilus altoensis* subspec. nov., Dept. Piura, El Alto.
Fig. 6. *Scutalus mariopenai* spec.nov. Specimen aestivating on rock.
Fig. 7. Type locality of *Scutalus mariopenai* spec. nov., Dept. Ancash, Catzcal.
Fig. 8. Habitat where *Drymaeus strigatus* was found, near Río Arabela. Photo: G. Montalván.
Fig. 9. Living specimen of *Bostryx turritus* (Broderip).
Figs 10-13. *Scutalus mariopenai* spec.nov. Living specimens.
Fig. 11. Living specimen of *Drymaeus (D.) cecileae* (Moricand).
Fig. 12. Living specimen of *Drymaeus strigatus* (Sowerby). Photo: G. Montalván.
Fig. 14. Living specimen of *Corona pfeifferi* (Hidalgo). Photo: C. Rivero.

Figs 15-20. Variation in *Thaumastus flori* (Jousseaume). 15-16, FG, shell height 65.0 mm; 17-18, VMA 0179, shell height 64.4 mm; 19-20, VMA 0180, shell height 77.6 mm.
Figs 21-22. *Bostryx chusgonensis sipas* subspec. nov., holotype RMNH 114059, shell height 13.5 mm
Figs 23-25. *Bostryx fragilis* spec.nov. 23, holotype RMNH 114063, shell height 18.0 mm; 24, paratype VMA 0021, shell height 17.4 mm; 25, upper whorls showing fine, interrupted spiral lines and protoconch sculpture.

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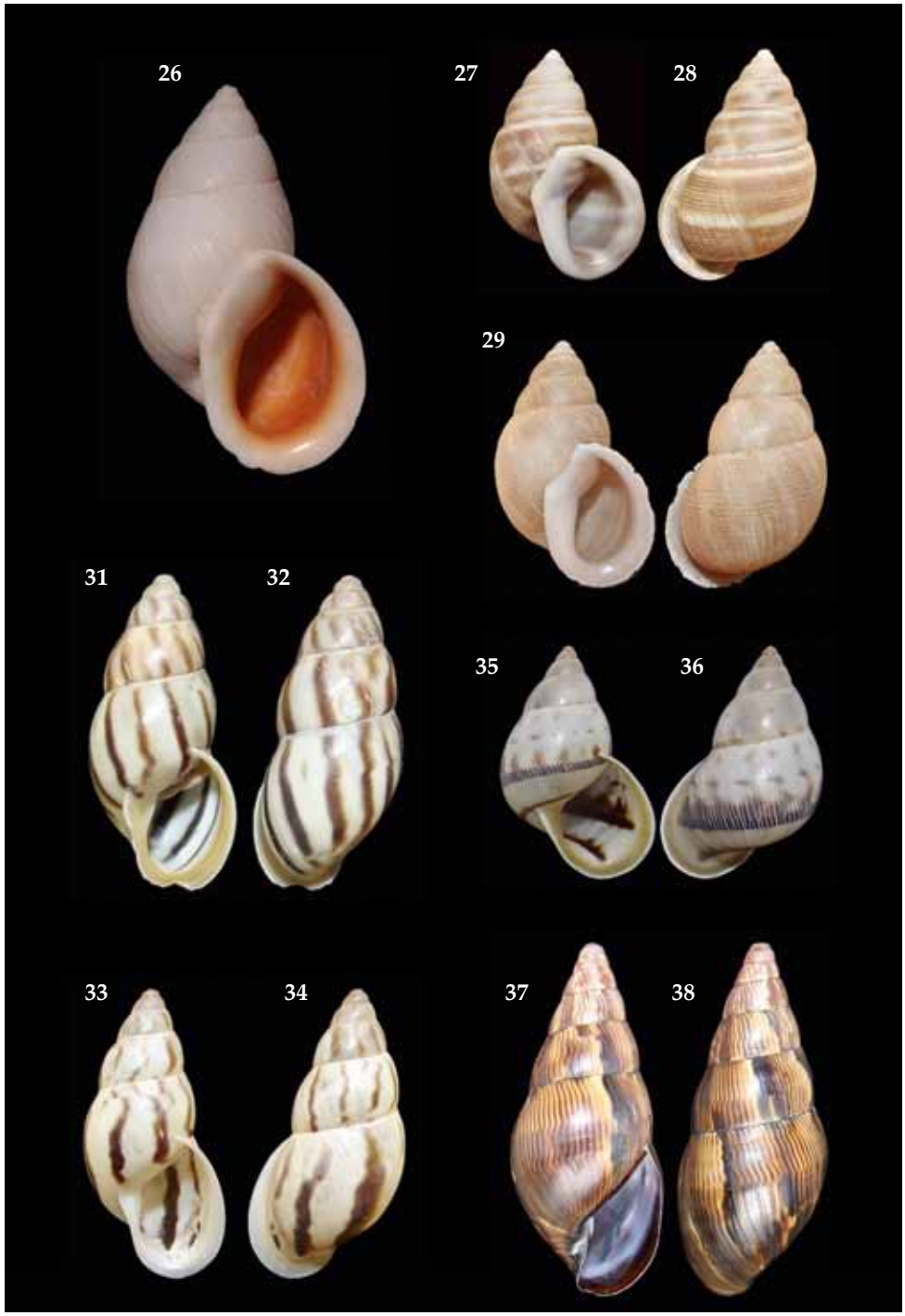
Fig. 26. *Scutalus phaeocheilus altoensis* subspec. nov., holotype RMNH 114045, shell height 37.2 mm
Figs 27-30. *Scutalus mariopenai* spec.nov. 27-28, holotype RMNH 114055, shell height 41.1 mm; 29-30, paratype RMNH 114056.
Figs 31-32. *Drymaeus (D.) cecileae* (Moricand), RMNH 114184, shell height 21.0 mm.
Figs 33-34. *Drymaeus (D.) strigatus* (Sowerby), RMNH 114062, shell height 21.7 mm.
Figs 35-36. *Drymaeus (D.) branneri* F. Baker, VMA 0176, shell height 27.0 mm.
Figs 37-38. *Corona pfeifferi* (Hidalgo), RMNH 114185, shell height 52.2 mm.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